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SOME NEW SPECIES OF *MESOPSOCUS* (PSOCOPTERA : MESOPSOCIDAE) FROM SOUTHERN AFRICA.

By C. N. Smithers.

(*P.O. Box* 8100, *Causeway, Southern Rhodesia*).

Manuscript received 18th January, 1957.

(Read 1st May, 1957).

With 15 Text-figures.

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I. Introduction.

The literature records two species of the genus *Mesopsocus* Kolbe from the Ethiopian Region. Enderlein (1910) described *Mesopsocus montinus* from Kilimanjaro, and reports having seen a male of *M. unipunctatus* (Müll.), a European species, from the Cape. The present paper describes five hitherto unknown species of the genus from various parts of southern Africa, four of which exhibit the strong sexual dimorphism usual in this genus ; of the fifth species only the male has been taken.

The salient features of *Mesopsocus* species are as follows :

Adults with 3-segmented tarsi ; antennae 13-segmented ; males winged, females apterous or with only vestiges of wings (*Mesopsocus laticeps* (K.), of Europe, is exceptional in having both sexes winged) ; in the male, areola postica tall and free, pterostigma elongated, veins and wing margin glabrous, relationship between *Rs* and *M* variable, hypandrium simple and phallosome with parameres apically dilated, with or without an internal terminal lobe ; in the female, gonapophyses complete, subgenital plate with a median lobe.

II. Descriptions of New Species.

Mesopsocus shiffi sp. n.

Female.

Coloration (in alcohol). Head brown, with darker markings ; epicranial suture very distinct, dark ; vertex spotted, each half having a double line of spots running along the median suture, across the occipital region and mesad of eye ; the area thus enclosed carries a brown patch, not quite as dark as surrounding spots ; frons with irregular brown marks in the mid-line ; antenna base surrounded by a dark ring ; postclypeus lined as usual in the group, the lines being discontinuous in the mid-line when viewed from dorsal aspect,

discontinuous laterally when seen from in front; anteclypeus pale, gena unmarked. Antenna with scape, pedicel and first flagellar segment pale brown, second flagellar segment darker, remainder of antenna dark brown. Eyes black. Maxillary palp very pale, except for the pale brown distal half of final segment. Dorsum of prothorax with a dark patch on either side of mid-line, another at lateral angle of dorsum; meso-and metathorax mottled brown and light brown; pleura brown, sutures darker. Legs very pale brown with dark spots on the femora; the spots are mostly distinct but coalesce near tibial joint to form a brown band on inner side; tibiae pale, darker-tipped; first tarsal segment pale brown becoming darker distally, remainder of tarsus dark brown. Abdomen brown, speckled dorsally with darker spots, ventrally unspotted; terminal structures dark brown.

Morphology. Wingless. Length of body (in alcohol) 2·95 mm. Epicranial suture very distinct; postclypeus bulging. Length of antenna 3·2 mm. Relative lengths of antennal segments: 1·4 : 1·0 : 5·0 : 4·8 : 4·4 : 4·0 : 2·8 : 2·6 : 2·0 : 1·7 : 1·3 : 1·0 : 0·8. Antenna with scape normal, pedicel narrowing distally, flagellum with sparse, short setae. Eyes hemispherical and prominent.

$$\frac{\text{IO}}{\text{D}} \text{ (Badonnel) } 2{\cdot}0 : 1.$$

$$\frac{\text{IO}}{\text{D}} \text{ (Pearman) } 2{\cdot}4 : 1.$$

Ocelli absent. Dorsum of prothorax not overhung by the mesothorax and visible from above, being about half as deep as that of other thoracic segments; meso-and metathorax both reduced. Hind tarsus without ctenidiobothria, these being replaced by a double row of setae. Relative lengths of hind tarsal segments: 4·5 : 1·0 : 1·3. Epiproct (fig. 10) simple, with gently rounded posterior border, setose. Paraproct (fig. 10) large, with a roughly triangular field of 16 trichobothria, the setae being well separated from one another; part of the paraproct carrying the trichobothria convex, the posteriorly projecting part flat and setose; at the posterior edge of convexity lies a strongly sclerotised cone with apex directed caudad. Subgenital plate (fig. 11). Gonapophyses (fig. 10).

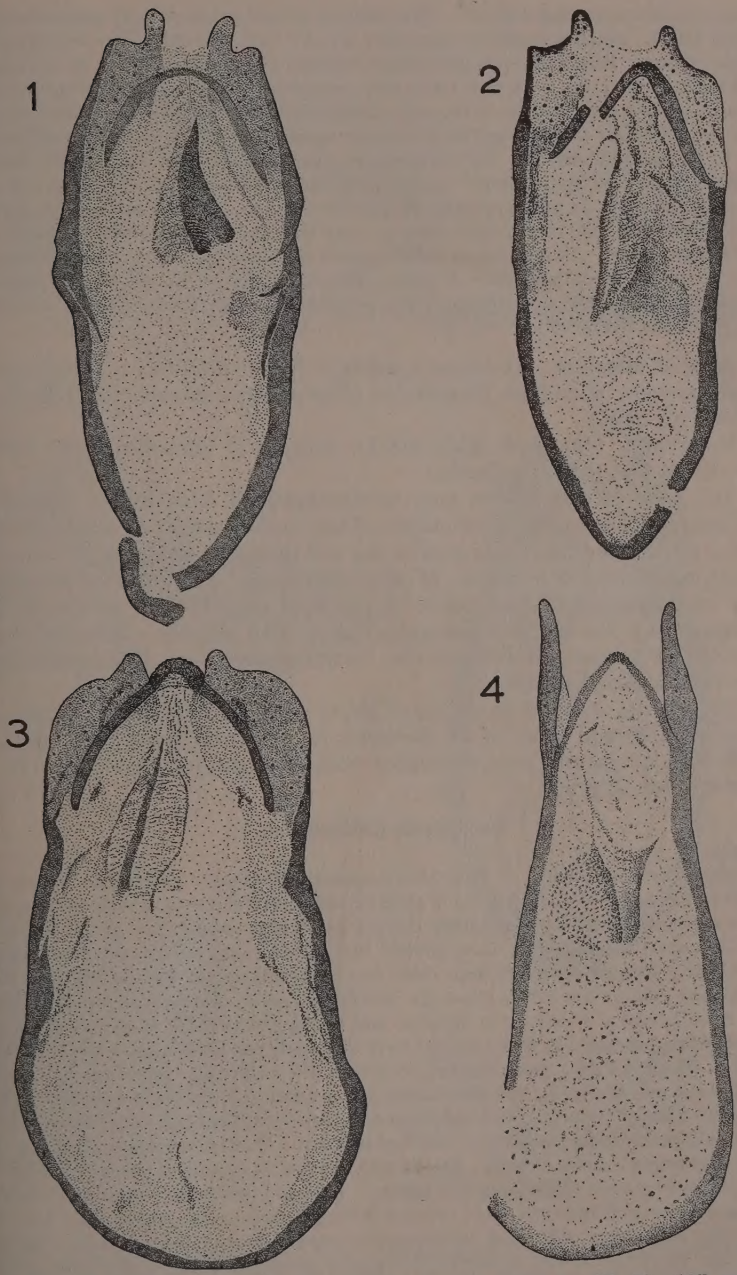
Male.

Coloration (in alcohol). Head brown, marked with dark brown; epicranial suture dark, sharply defined; vertex marked as in female but less distinctly; frons with transverse dark bands from which 4 dark stripes run to epistomial suture; postclypeus with discontinuous stripes, these most clearly defined dorsolaterally and anteriorly; anteclypeus pale; gena unmarked, brown. Antenna (incomplete) with scape and pedicel pale, first flagellar segment pale basally becoming darker distally, remaining segments dark brown. Eyes black. Ocelli black. Maxillary palp with first 2 segments pale, distal segments brown. Thorax dark brown dorsally, except for a median paler line and a paler area along posterior margin of lateral lobes; this area gives off a pale line into the dark brown of the lateral lobes; pleura brown with dark bordered sclerites. Legs with femora pale brown lightly spotted irregularly with brown; tibiae pale with darker tips; tarsal segments and claws brown. Fore wings hyaline, faintly tinged with brown, anal cell darker in middle section; veins brown. Hind wings hyaline; veins brown. Abdomen brown, terminal structures slightly darker.

Morphology. Winged. Length of body (in alcohol) 2·3 mm. Relative lengths of antennal segments: 1·2 : 1·0 : 6·7 : 5·5 : 5·2 : 4·2 : 3·3 : 1·5 . . . (antennae incomplete). Antenna with normal scape, pedicel broadest at the middle, flagellum more setose and with longer setae than in female. Eyes hemispherical, prominent.

$$\frac{\text{IO}}{\text{D}} \text{ (Badonnel) } 2{\cdot}0 : 1.$$

$$\frac{\text{IO}}{\text{D}} \text{ (Pearman) } 2{\cdot}5 : 1.$$



FIGS. 1–4.—Male phallosome of (1) *Mesopsocus tumorosus* sp. n. (2) *M. shiffi* sp. n. (3) *M. incomitatus* sp. n. (4) *M. alienatus* sp. n.

Anterior ocellus somewhat reduced. First segment of hind tarsus with 21 ctenidiobothria, second with 3. Relative lengths of segments : 3·7 : 1·0 : 1·2. Length of fore wing 3·4 mm., width 1·2 mm. Fore wing with pterostigma rounded posteriorly ; *Rs* and *M* fused for a very short length ; Cu_{1a}, where it forms outer margin of areola postica, slightly incurved giving a concave outer margin to the cell. Length of hind wing 2·5 mm., width 0·84 mm. Hind wing with *Rs* and *M* fused for a distance equal to that of *M* from its parting from Cu_1 to its junction with *Rs*. Epiproct simple, almost semicircular, without any distinct posterior angle. Paraproct simply shaped, with marginal setae on posterior edge and with large field of about 34 trichobothria. Hypandrium simple, with distinct circular field of setae placed near each end of hind margin ; each field with about 20 setae. Phallosome (fig. 2) with " arch " of the aedeagus slightly rugose apically ; parameres distally broadened with a strong lobe on inner side of apex. (Figure 2 is drawn from a slightly distorted preparation, the slight asymmetry of the parameres as seen *in situ* is thus somewhat exaggerated in the figure.)

Material examined.—Holotype ♀, allotype ♂, South Africa : Grahamstown, Cape Province, taken from Renosterbos (*Elytropappus rhenocerotus* (L.f.) Less.) iii.1954 (*C. Shiff*).

Holotype ♀ (dissected, Slide 523–1), allotype ♂ (dissected, Slide 523–2), retained in the author's collection.

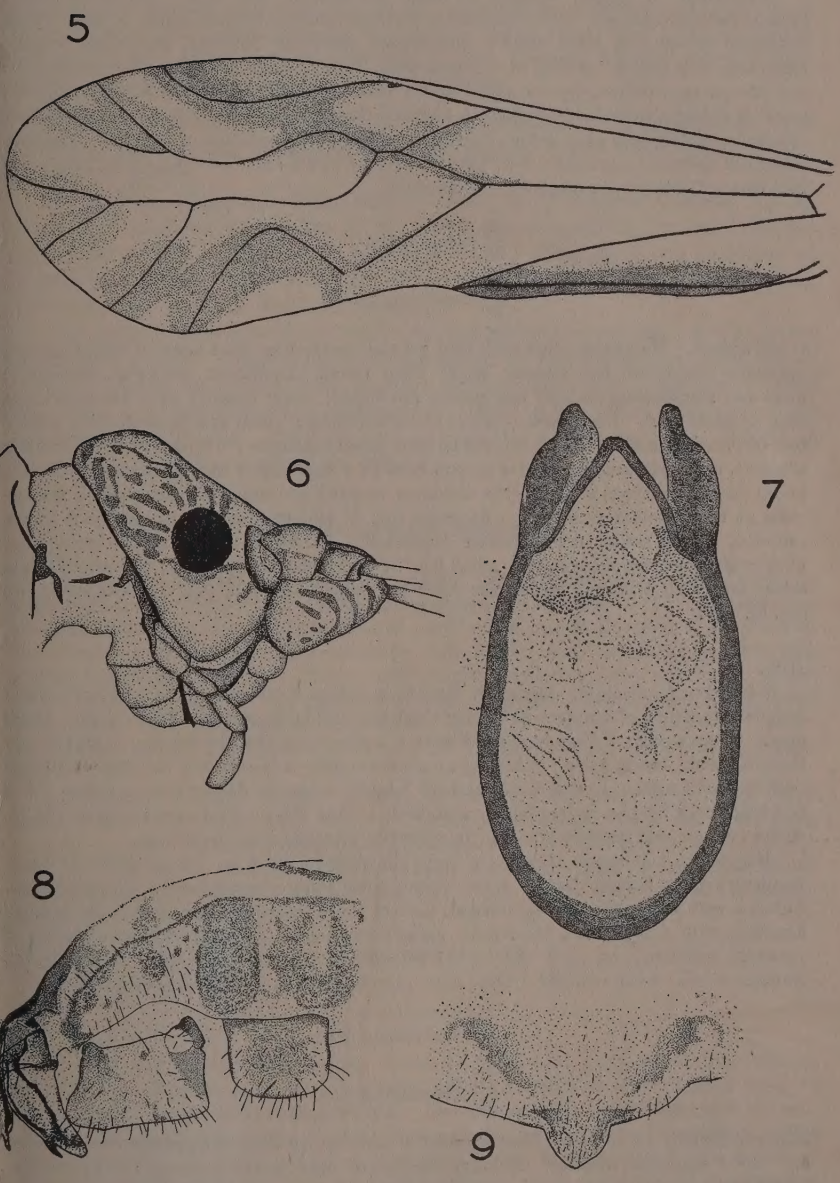
The male of this species may be distinguished from others, except *M. montinus*, by the concave outer margin of the areola postica ; from *M. montinus* it may be distinguished by its smaller size and shorter wing length, *M. montinus* having wing length of 5·75 mm., *M. shiffi* of 3·4 mm. The female of this species may be distinguished from others of the Ethiopian Region, except *M. unipunctatus*, by the rounded subgenital plate with slightly constricted base ; from the latter species it differs in size, being much smaller. The gonapophyses (fig. 10) are also distinctive.

This species is named in honour of Mr. C. Shiff, who collected the specimens of this species and those of *M. distinctus* sp. n. (described below) during his studies of the insect fauna associated with *Elytropappus rhenocerotus* in the Eastern Cape Province.

Mesopsocus distinctus sp. n.

Female.

Coloration (in alcohol). A light brown species with darker markings. Vertex with 4 rows of irregular elongated spots, 2 rows on either side of the epicranial suture ; these rows continue behind a less distinctly defined round spot on each half of the vertex and run between it and the eyes ; frons marked with a dark V, the arms of which are directed anteriorly ; anterior margin of frons dark, the line continuing to encircle the bases of the antennae ; when viewed from above the postclypeus shows darker lines running forward, the more lateral of which curve round to end at the ventral edge of the sclerite ; anteclypeus pale, margined in dark brown. Eyes with dark ring behind and below from which radiate irregular lines ; gena bordered in brown, otherwise pale. Eyes black. Antenna with scape pale externally and dark internally ; pedicel pale, darker at base and distally ; first two flagellar segments pale, dark-tipped, remainder of flagellum dark brown. Maxillary palp pale, with a dark tip to the final segment. Thorax mottled in shades of dark and light brown ; coxae mottled ; femora with external, anterior and posterior longitudinal stripes, the external stripe being the boldest ; internally incomplete rings of dark brown occur at bases of femora and about two-thirds along their lengths ; tibiae pale ; first tarsal segment pale, tipped with dark brown, second segment darker, third darkest. Abdomen speckled in various shades of brown, the speckles becoming denser and confluent on segments V and VI ; terminalia pale, with darker markings.



FIGS. 5–9.—*Mesopsocus distinctus* sp. n. (5) Left fore wing of male. (6) Profile of female head. (7) Male phallosome. (8) Female epiproct, paraproct and gonapophyses. (9) Subgenital plate of female.

Morphology. Wingless. Length of body (in alcohol) 3·9 mm. Epicranial suture present but not distinct; vertex somewhat flattened, sloping forward gently to frons which continues forward in same plane; postclypeus extremely bulbous, somewhat conical, extending well beyond pedicel of antenna when viewed from the side; the anteclypeus and labrum are overhung by the postclypeus; head triangular when seen in profile (fig. 6); scape of antenna remarkably bulbous; first two flagellar segments with very sparse setae, remainder of flagellum more setose, becoming densely so towards end of antenna. Relative lengths of antennal segments: 2·0 : 1·0 : 5·7 : 7·2 : 7·7 : 7·5 : 5·7 : 5·0 : 4·2 : 3·0 : 2·0 . . . (antennae of holotype incomplete). Eyes small.

$$\frac{\text{IO}}{\text{D}} \text{ (Badonnel) } 5{\cdot}0 : 1.$$

$$\frac{\text{IO}}{\text{D}} \text{ (Pearman) } 5{\cdot}0 : 1.$$

Ocelli absent. Maxillary palps with stiff bristles protruding from apex of final segment, otherwise somewhat less densely setose than usual. Prothorax normally developed; meso-and metathorax distinct but poorly developed, being dorsally only about twice as deep as prothorax. Hind tarsi without ctenidiobothria; these are replaced by a double row of strong setae. Relative lengths of hind tarsal segments: 5·0 : 1·0 : 1·2. Abdomen elongate, becoming broader from segments II to IV; segments V and VI forming a distinct hump dorsally, caudad of which the abdomen narrows gradually to reach normal proportions at the terminal structures. Epiproct (fig. 8) almost square, with posterior angles rounded, margin setose, dorsal surface roughened. Paraproct (fig. 8) almost rectangular with ventroposterior angle acute; small field of 6 trichobothria present; posterior margin setose and with scattered setae over surface. Subgenital plate (fig. 9). Gonapophyses (fig. 8).

Male.

Coloration (in alcohol). Generally similar in colour to female. The first and second flagellar segments of antenna not paler than succeeding segments. Eyes black. Ocelli grey. Thorax more uniformly shaded brown, less mottled than in female; coxae darker than in female, less mottled; other leg coloration similar to female but longitudinal stripes confluent and paler; tips of tibiae and all 3 tarsal segments darker brown. Fore wings and hind wings hyaline, tinged faintly with brown; fore wings with brown markings (fig. 5). Abdomen pale and sparsely and faintly spotted; terminal structures dark.

Morphology.—Winged. Length of body (in alcohol) 2·5 mm. Head relatively much smaller than in female, but of same shape, with similar development of postclypeus. Antenna with scape broadly cylindrical, pedicel much narrower, broadest in the middle; flagellum with fairly dense, fine setae. Length of antenna 3·8 mm. Relative lengths of antennal segments: 1·2 : 1·0 : 6·0 : 6·5 : 7·0 : 6·5 : 5·2 : 4·5 : 2·7 : 2·7 : 2·2 : 1·7 : 1·2. Anterior ocellus much reduced. Eyes more prominent than in female, hemispherical.

$$\frac{\text{IO}}{\text{D}} \text{ (Badonnel) } 2{\cdot}3 : 1.$$

$$\frac{\text{IO}}{\text{D}} \text{ (Pearman) } 2{\cdot}8 : 1.$$

Thorax normally developed. First segment of hind tarsus with 15 ctenidiobothria, second and third segments without. Relative lengths of hind tarsal segments: 3·1 : 1·0 : 1·3. Length of fore wing 3·4 mm., width 1·0 mm. Fore wing with *Rs* and *M* fused for a short length; Cu_1 smoothly arched. Length of hind wing 2·5 mm., width 0·7 mm. Hind wing with *Rs* and *M* fused for a short length, R_{2+3} short, running at a sharp angle to anterior margin of wing. Abdomen of normal cylindrical form. Epiproct roughly in

form of an equilateral triangle with posterior angle rounded; posterior margin with 8 setae; paraproct also roughly triangular with a few marginal setae at posterior angle; large circular field of trichobothria present; hypandrium simple, with small group of setae at each end of hind margin; phallosome (fig. 7) with aedeagal "arch" rather sharply angled; parameres broad, tapering into an apical lobe.

Material examined.—10 ♀, 7 ♂, South Africa: Grahamstown, Cape Province, taken from Renosterbos (*Elytropappus rhenocerotus* (L.f.) Less.), iii.1954 (*C. Shiff*).

Holotype ♀ (dissected, Slide 524–1), allotype ♂ (dissected, Slide 524–2) paratype ♂ (dissected, Slide 524–3), 6 ♀ and 2 ♂ paratypes (in alcohol, Tube no. 524) in the author's collection; 1 paratype ♀ and 1 paratype ♂ will be deposited in each of the following: the British Museum (Nat. Hist.), the Congo Museum, Tervuren, and the U.S. National Museum.

The males of this species are easily recognised by the extensive brown areas of the fore wings. The female is distinguished by the subgenital plate, which is short, almost triangular, with slightly curving sides and a bluntly rounded tip. The gonapophyses are distinctive. Both sexes show the extremely distended postclypeus. This feature is seen to a slightly lesser extent in *M. nasutus* Enderlein from North Africa.

Mesopsocus incomitatus sp. n.

Male.

Coloration (in alcohol). A pale brown species, with the following darker brown: a single large spot on either side of the epicranial suture, the area between the ocelli and eyes, the epicranial suture, the convergent lines on postclypeus, and the flagellum of the antenna. Eyes black. Ocelli pale, margined internally with black. Maxillary palp pale brown with slightly darker final segment. Thorax with anterior and lateral lobes pale brown, tinged with brown; scutellum brown; pleura pale brown; legs pale brown, except for the darker brown tarsi. Fore wings hyaline, very faintly tinged with brown; veins brown; pterostigma pale. Hind wings hyaline; veins brown. Abdomen pale brown, terminal structures brown.

Morphology. Winged. Length of body (in alcohol) 3·0 mm. Head large. Epicranial suture distinct; vertex, frons and postclypeus finely pubescent; postclypeus strongly bulging. Relative lengths of antennal segments: 1·4 : 1·0 : 10·3 : 8·3 : 7·7 : 7·1 : 4·8 . . . (antennae incomplete). Scape short and cylindrical; pedicel considerably narrowed distally; flagellar segments with short, fine, evenly spaced setae. Eyes prominent, hemispherical.

$$\frac{I0}{D} \text{ (Badonnel) } 1{\cdot}4 : 1.$$

$$\frac{I0}{D} \text{ (Pearman) } 1{\cdot}8 : 1.$$

Ocelli large and conspicuously raised. Relative lengths of segments of hind tarsus: 5·5 : 1·0 : 1·5. First segment of hind tarsus with 23 ctenidiobothria, second with 1; claws robust. Length of fore wing 3·0 mm.; fore wing with *Rs* and *M* meeting in a point; *Rs* divides opposite widest part of pterostigma; areola postica tall; Cu_2 slightly curved along its length; M_1 meets wing margin at wing apex. Length of hind wing 2·2 mm.; *Rs* and *M* of hind wing fused for a moderate length; R_1 joins costal margin opposite fork of *Rs*. Abdomen normal. Epiproct rectangular, setose, median portion of hind margin protruding a little; paraproct with large circular field of trichobothria; hypandrium simple, mostly without setae except at the sides of the hind margin, each end of which has

10–15 strong setae ; phallosome (fig. 3) of the usual *Mesopsocus* type ; the terminal " arch " of the aedeagus rugose ; parameres distally broadened with a protruding lobe on inner side of apex.

Female.—Unknown.

Material examined.—Holotype ♂, South Africa : Upper Tabeni River, near main Richmond to Ixopo road, Natal, 7.v.1955 (*C. N. Smithers*).

Holotype ♂ (dissected, Slide 137–1) in author's collection.

This species can be distinguished from *M. distinctus* by the lack of extensive brown markings on the wings, from *M. unipunctatus* (Müll.), *M. montinus* End., *M. shiffi*, *M. distinctus* and *M. alienatus* spp. n. by the junction of *Rs* and *M* being in a point, and from *M. tumorosus* sp. n. by the slightly smaller size and shape of the phallosome which, in *M. tumorosus*, has a well-developed and curved inner lobe at the apex of the paramere ; the phallosome is relatively broader than in *M. tumorosus*.

Mesopsocus tumorosus sp. n.

Female.

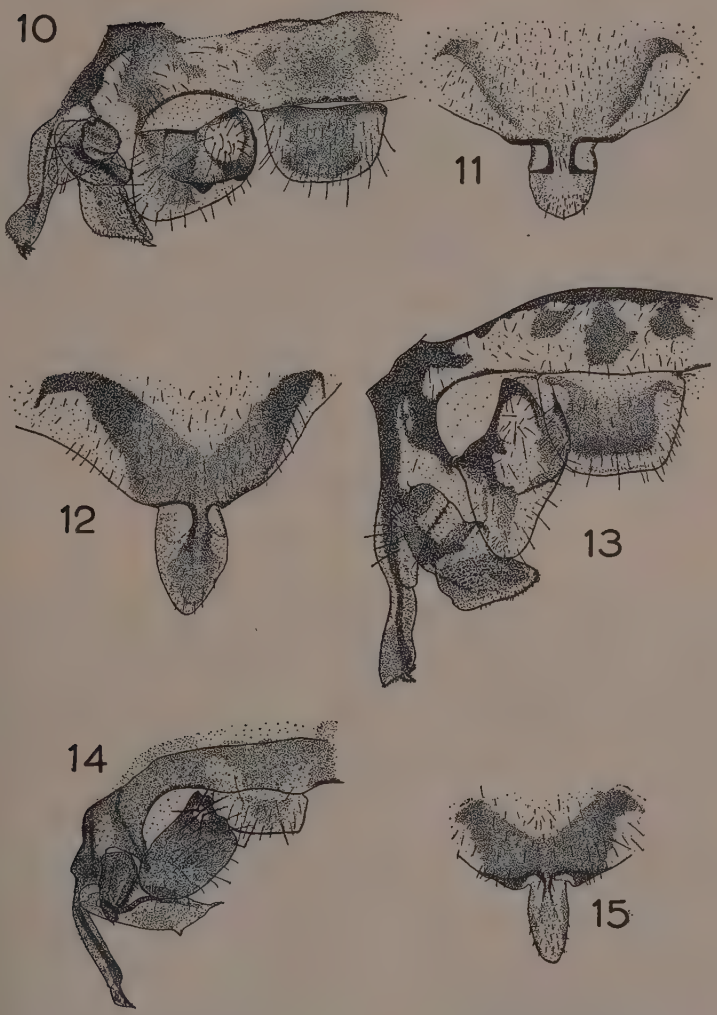
Coloration (in alcohol). A grey species with dark mottlings, very variable in depth of colour and extent of markings. Epicranial suture dark brown ; each half of vertex with a large, central round brown patch, the remainder of the vertex with dark brown spots ; frons grey with dark brown mottlings ; postclypeus regularly and very distinctly marked with anteriorly converging dark brown stripes ; anteclypeus grey ; genae grey ; a dark band around antenna base ; a large and a smaller dark spot below eye, the larger being anterior to the smaller. Antenna with scape and pedicel pale ; first flagellar segment brown ; second basally brown becoming almost black distally, remaining segments almost black. Eyes grey, with a dorsolateral brown stripe. Ocelli absent. Maxillary palpi pale except for fourth segment which is very dark brown, almost black. Prothorax grey, a thin dark brown line runs across the hind margin, curving forwards at the sides ; mid-line dark brown and on either side a dark patch spreads across the notum halfway to the lateral margin ; lateral to this lies a more anteriorly placed triangular dark patch. Meso- and metathorax dorsally grey, mottled with dark brown and brown ; a median, dark line continuous with that of the prothorax runs to the base of the abdomen. Legs grey ; femora with an irregular dark ring near tibial joint and externally two rows of elongate spots, irregularly placed ; tibiae distally almost black ; tarsi almost black. Abdomen grey ventrally, dorsally grey with numerous brown spots of various sizes ; laterally these spots are much larger with paler centres ; segments III and IV have, dorsally, finer spots on a pale brown background. Terminal structures grey with almost black markings.

Morphology. Apterous. Length of body (in alcohol) 3·65 mm. Epicranial suture distinct, postclypeus strongly bulging. Antenna with scape almost as broad as long, pedicel narrowing distally ; flagellum much narrower than basal segments ; with sparse short erect setae. Length of antenna 4·0 mm. Relative lengths of antennal segments : 1·4 : 1·0 : 7·0 : 6·2 : 5·8 : 5·0 : 3·4 : 2·8 : 2·4 : 1·8 : 1·4 : 1·2 : 0·8. Eyes hemisperical, prominent.

$$\frac{I0}{D} \text{ (Badonnel) } 2{\cdot}3 : 1.$$

$$\frac{I0}{D} \text{ (Pearman) } 2{\cdot}5 : 1.$$

Pronotum and metanotum about equal in depth, mesonotum about twice as deep. Hind tarsus without ctenidiobothria. Relative lengths of hind tarsal segments : 3·8 : 1·0 : 1·4. Abdomen rotund, dorsally strongly dome-shaped, the whole abdomen being pyriform.



FIGS. 10–15.—(10)–(11) *Mesopsocus shiffi* sp. n. (10) Female epiproct, paraproct and gonapophyses. (11) Subgenital plate of female. (12)–(13) *M. tumorosus* sp. n. (12) Subgenital plate of female. (13) Female epiproct, paraproct and gonapophyses. (14)–(15) *M. alienatus* sp. n. (14) Female epiproct, paraproct and gonapophyses. (15) Subgenital plate of female.

Epiproct (fig. 13) almost rectangular with posterior angles rounded. Paraproct (fig. 13) with field of about 20 trichobothria. Subgenital plate (fig. 12). Gonapophyses (fig. 13).

Male.

Coloration (in alcohol). Generally grey with dark brown markings. Epicranial suture dark brown; vertex grey, marked as in female; frons grey with dark brown markings; postclypeus striped as in female, stripes slightly darker; anteclypeus grey; genae grey, with dark band at antenna base; spots below eyes reduced to a single small spot in position of the larger in female. Antenna with scape and pedicel brown, flagellum dark brown. Eyes as in female. Ocelli dark brown. Maxillary palp with first two segments pale, third brown, fourth dark brown. Meso- and metathorax dark brown dorsally except for pale brown areas along the sutures, the posterior border of the lateral lobes from which a pale spur enters the darker region, and a median line on the anterior lobe; pleura grey with darker marking along sutures. Legs grey, femora with a double external row of elongate brown marks; tibiae with dark brown apices; tarsi dark brown. Fore wings hyaline, pterostigma brown; veins dark brown. Hind wings hyaline; veins brown. Abdomen grey with mottlings in various shades of brown; terminal structures dark brown.

Morphology. Length of body (in alcohol) 2·6 mm. Head relatively smaller than in female; postclypeus strongly bulging. Antennae with finer and closer-spaced setae. Length of antenna 3·0 mm. Relative lengths of antennal segments: 1·3 : 1·0 : 6·2 : 6·0 : 5·2 : 4·5 : 3·2 : 2·5 : 2·2 : 1·7 : 1·3 : 1·2 : 0·7. Eyes hemispherical and prominent.

$$\frac{I0}{D}\text{ (Badonnel) } 2{\cdot}2 : 1.$$

$$\frac{I0}{\overline{D}}\text{ (Pearman) } 2{\cdot}4 : 1.$$

Ocelli somewhat prominent. Thorax normally developed. First segment of hind tarsus with 26 ctenidiobothria. Relative lengths of hind tarsal segments: 6·3 : 1·0 : 1·3. Length of fore wing 3·4 mm., width 1·2 mm. Fore wing with *Rs* and *M* meeting in a point. Areola postica tall. Length of hindwing 2·8 mm., width 0·9 mm. Hind wing with *Rs* and *M* fused for a moderate length. Abdomen normally developed, cylindrical. Epiproct and paraproct simple, the latter with a field of about 32 trichobothria. Hypandrium simple, with a group of setae at each end of hind margin. Phallosome (fig. 1) with aedeagal "arch" smoothly rounded; paramere broadened, the apex carrying a slightly outwardly curved inner apical lobe.

Material examined.—1 ♀, Southern Rhodesia: Lake McIlwaine, 13.v.56 (*A. S. Smithers*); 3 ♀ (including holotype ♀), Experiment Station, Salisbury, from *Pittosporium undulatum* Vent., 2.vi.1956 (*C. N. and A. S. Smithers*); 1 ♀, 3 ♂ and 9 nymphs, same collection data, 9.vi.1956; 4 ♀, 2 ♂ (including allotype ♂) and 9 nymphs, same collection data, 9.ix.1956; 2 ♀, 1 ♂, and 6 nymphs, Umwindzi River, near Salisbury, 10.xi.1956 (*same collectors*).

Holotype ♀ (dissected, Slide 429–1), and allotype ♂ (dissected, Slide 531–1) in author's collection. A male and female paratype will be deposited in each of the following: the British Museum (Nat. Hist.), the Congo Museum, Tervuren, and the U.S. National Museum. The remaining paratype specimens (in alcohol) are retained in the author's collection (Tube nos. 420, 429, 438, 531, 572).

The males of this species are distinguished, except from those of *M. incomitatus*, by the junction of *Rs* and *M* in the fore wing being in a point. The latter species differs from *M. tumorosus* in having a concave outer margin to the areola postica; that of *M. tumorosus* is normally rounded. The female can

be recognised by the dorsal protuberance on the abdomen, giving a conspicuous " hump-backed " appearance. This feature is found, in a greatly exaggerated form, in *M. dromedarius* Ball, from Morocco.

Mesopsocus alienatus sp. n.

Female.

Coloration (in alcohol). A very dark brown species. Head brown with almost black markings. Epicranial suture pale ; vertex dark brown with a double line of darker dots arranged across the back of the head from which double lines of dots run mesad of the eyes and on either side of the median suture for about half its length ; frons dark brown ; postclypeus completely striped with about 7 stripes on each side of the mid-line ; anteclypeus pale brown ; genae dark brown. Antennae dark brown throughout length. Eyes black. Maxillary palpi dark brown. Thorax dark brown dorsally (including notum of prothorax) with a broad, paler median line along its entire length. Legs dark brown, parts of femora and tibiae adjacent to their joints paler. First evident segment of abdomen dark brown dorsally with a median paler area in line with pale median line of thorax ; remainder of abdomen dark brown with very dark, irregular mottlings dorsally, paler ventrally ; terminal structures almost black.

Morphology. Apterous. Length of body (in alcohol) 2·2 mm. Head broad, almost rectangular when viewed from above ; postclypeus bulging. Length of antenna 1·1 mm. Relative lengths of antennal segments : 1·0 : 1·0 : 1·7 : 1·5 : 1·5 : 1·2 : 1·0 : 1·0 : 1·0 : 0·7 0·7 : 1·0 : 0·6. Antenna with scape and pedicel of subequal width and much broader than flagellar segments, which are also more nearly equal in width than usual. Eyes small.

$$\frac{\text{IO}}{\text{D}} \text{ (Badonnel) } 2{\cdot}5 : 1.$$

$$\frac{\text{IO}}{\text{D}} \text{ (Pearman) } 5{\cdot}0 : 1.$$

Ocelli absent. Prothorax distinctly visible from above, meso-and metathorax reduced, but not to same extent as prothorax. First segment of hind tarsus without ctenidiobothria. Relative lengths of hind tarsal segments : 3·2 : 1·0 : 1·4. Abdomen short and broad, giving a rotund appearance to the insect. Epiproct (fig. 14) broadly rectangular, about twice as wide as deep, with posterior angles rounded. Paraproct (fig. 14) deep and narrow, ventally rounded, posterior border setose, strongly sclerotised, with a small field of 5 or 6 trichobothria. Subgenital plate (fig. 15). Gonapophyses (fig. 14).

Male.

Coloration (in alcohol). Head similar to that of female in markings and colour, but generally a little paler. Eyes, antennae and maxillary palps coloured as in female. Ocelli dark. Thorax dark brown, median pale stripe not as distinct as in female. Legs dark brown. Fore wings hyaline, faintly tinged with brown ; veins brown. Hind wings hyaline ; veins brown. Abdomen mottled with light and dark brown ; terminal structures dark brown.

Morphology. Winged. Length of body (in alcohol) 1·75 mm. Antenna with scape and pedicel relatively broader than in female ; flagellum stouter than in female and more densely hairy, the hairs also being longer. Relative lengths of antennal segments : 1·0 : 1·0 : 2·6 : 2·3 : 2·3 : 2·3 : 1·6 : 1·6 : 1·3 : 1·3 : 1·3 : 1·3 : 1·0.

$$\frac{\text{IO}}{\text{D}} \text{ (Badonnel) } 2{\cdot}8 : 1.$$

$$\frac{\text{IO}}{\text{D}} \text{ (Pearman) } 3{\cdot}2 : 1.$$

First segment of hind tarsus with 8 ctenidiobothria, the " comb " structures at the base of the hairs are much reduced. Relative lengths of hind tarsal segments : 3·0 : 1·0 : 1·5. Length of fore wing 2 mm., width 0·6 mm. Fore wing with *Rs* and *M* fused for a short length ; Cu_{1a} gently curved so as to give a convex outer margin to the areola postica. Length of hind wing 1·5 mm., width 0·4 mm. Hind wings with *Rs* and *M* fused for more than twice the length of fusion of the corresponding veins in the fore wing. Epiproct with almost semicircular hind border, with only 5 marginal setae. Paraproct with large field of 17–19 trichobothria. Hypandrium simple, setose at sides of hind margin. Phallosome (fig. 4) elongate ; aedeagal " arch " somewhat pointed ; parameres elongated, broadened, narrowing apically.

Material examined.—4 ♀ (including holotype), 1 ♂ (allotype) and 1 nymph, Southern Rhodesia : near bridge over Shawanoe River on Salisbury to Mtoko road, 17.vi.1956 (*C. N. and A. S. Smithers*) ; 4 ♀, same locality, 24.vi.1956 (*A. S. Smithers*).

Holotype ♀ (dissected, Slide 460–1), allotype ♂ (dissected, Slide 458–1), 4 ♀ paratypes and 1 nymph (in alcohol, Tubes 470 and 460 respectively) in author's collection. A paratype ♀ will be deposited in each of the following : the British Museum (Nat. Hist.), the Congo Museum, Tervuren, and the U.S. National Museum.

This species is the smallest to be discussed in this paper. The male has a fore wing length of only 2·0 mm., the phallosome is relatively large and greatly elongated, the parameres particularly so. The female is recognisable by the rotund form of the abdomen, dark colour and small eyes, I0/D (Pearman) being 5·0 : 1, whereas I0/D (Badonnel) is 2·5 : 1. In both sexes the antennae are relatively short. This species stands apart from the other members of the genus in general facies, in particular in the features mentioned above, which may, possibly, warrant subgeneric distinction. Until our knowledge of the genus in Africa is more extensive, however, it is not considered advisable to make such a distinction, as there seems a strong possibility of intermediate forms being taken.

III. Remarks.

The genus *Mesopsocus* is a comparatively homogeneous one, with one species, *M. alienatus*, standing apart. In the males the main distinguishing features are to be found in the venation, *e.g.* in the relationship between veins *Rs* and *M*, and in the shape of the phallosome. The latter feature is the most useful. The hypandrium, epiproct and paraproct are not of particular importance in this respect. As in several groups within the Order, the venation in this genus is liable to variation ; sometimes even the wings of opposite sides of the same specimen show differences. The features of greatest value for determination of the female are to be found in the shape of the subgenital plate, the shapes of the gonapophyses, epiproct and paraproct, and the I0/D ratio.

The following key may be used in the determination of the Ethiopian species of *Mesopsocus*, but constant reference should be made to figures of the female gonapophyses and male phallosomes, which show excellent features which cannot conveniently be included in a verbal key.

IV. Key to Ethiopian Species of the Genus *Mesopsocus*.

Adults winged . . . . . Males
Adults apterous . . . . . Females

Males.

1 Fore wings without brown markings, sometimes a little coloration in cell Cu_2 2
Fore wings with extensive brown markings . . . . . **distinctus** sp. n.
2 *Rs* and *M* of fore wing meeting in a point 3
Rs and *M* of fore wing not meeting in a point 4
3 Fore wing length 3·4 mm., aedeagal " arch " smoothly rounded, parameres with conspicuous, outwardly curved inner lobes **tumorosus** sp. n.
Fore wing length 3·0 mm., aedeagal " arch " with distinct apex, parameres with inconspicuous inner apical lobes . . . **incomitatus** sp. n.
4 *Rs* and *M* joined by a short crossvein . . . . . **unipunctatus** (Müll.)
Rs and *M* fused for a greater or lesser distance 5
5 Areola postica with external margin incurved, fore wing length much greater than 2·0 mm. 6
Areola postica normal, fore wing length 2·0 mm. . . . . **alienatus** sp. n.
6 Fore wing length 5·75 mm. . . . . **montinus** Enderlein
Fore wing length 3·4 mm. . . . . **shiffi** sp. n.

Females.[1]

1 Abdomen without strong dorsal swelling 2
Abdomen with strong dorsal swelling . . . . . **tumorosus** sp. n.
2 Antenna at least as long as body 3
Antenna shorter than body . . . . . **alienatus** sp. n.
3 Subgenital plate with posterior lobe constricted at base, about as long as broad 4
Subgenital plate with roughly triangular posterior lobe, broad-based . 5
4 Body length 4·0 mm. . . . . **unipunctatus** (Müll.)
Body length less than 3·0 mm. . . . . **shiffi** sp. n.
5 Subgenital plate with apex slightly rounded, no conspicuous setae **distinctus** sp.n.
Subgenital plate with smoothly rounded posterior border, conspicuous setae present . . . . . **montinus** Enderlein

V. Summary.

Five hitherto unknown species of the genus *Mesopsocus* are described from southern Africa and a key to the Ethiopian species is given. Most of the new species are closely related to known forms, except *M. alienatus* sp. n. which is distinct in certain features.

VI. Acknowledgments.

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[1] The female of *M. incomitatus* is not known.

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VII. Reference.

Enderlein, G., 1910, *Wiss. Ergebn. schwed. zool. Exped. Kilimandjaro, Meru Massaisteppen Deutsch-Östafrikas* **3** (15), (2) : 29–39, Taf. 5, 6 figs.